about a collision. Preferably, in this case, the microcomputer 90 activates a braking system of the subject vehicle to reduce the speed thereof.

As previously mentioned, the microcomputer 90 operates in accordance with a program stored in the internal ROM. Fig. 3 is a flowchart of a segment of the program. The program segment in Fig. 3 is executed for each of the directions (the angular directions) D1-DN of the transmission of the forward pulse laser beam which form the detection area. Thus, during every cycle or period of the motor drive signal outputted from the microcomputer 90 to the motor drive circuit 18, that is, during every period of the scanning of the detection area by the forward pulse laser beam, the program segment in Fig. 3 is repetitively executed a plurality of times.

As shown in Fig. 3, a first step 110 of the program segment sets the power control signal into a state corresponding to lower than a normal power.

A step 120 following the step 110 outputs the light-emission start requirement signal and the pulse-width control signal to the signal generation circuit 40. Therefore, the pulse generation circuit 40 outputs a pulse of the transmission signal to the laser-diode drive circuit 12. The time point of the leading edge of the pulse is determined by the light-emission start requirement signal, while the width of the pulse is determined by the pulse-width control signal.

The laser-diode drive circuit 12 activates the laser diode 11 in response to the pulse of the transmission signal so that the laser

diode 11 emits a corresponding pulse of the laser light. The time point of the leading edge of the pulse of the laser light is determined by the light-emission start requirement signal, while the width of the pulse of the laser light is determined by the pulse-width control signal. Since the power control signal is in the state corresponding to lower than the normal power, the power of the pulse of the laser light is lower than the normal power. The pulse of the laser light is made into a pulse of the forward laser beam. Since the power of the pulse of the forward laser beam is relatively low, the measurable distance to an object is shorter than normal one. Accordingly, only in the presence of an object spaced from the subject vehicle by shorter than the normal measurable distance, the comparator 35 outputs a high-level decision signal representing the reception of an echo.

A step 130 subsequent to the step 120 determines whether or not the comparator 35 outputs a high-level decision signal during a time interval corresponding to the low-power measurable distance. In the case where the comparator 35 outputs a high-level decision signal, that is, in the case where an object (an obstacle) is detected, the program advances from the step 130 to a step 150. In the case where the comparator 35 does not output a high-level decision signal, that is, in the case where an object (an obstacle) is not detected, the program advances from the step 130 to a step 140.

The step 140 sets the power control signal into a state corresponding to the normal power. After the step 140, the program advances to the step 150.

The step 150 outputs the light-emission start requirement signal and the pulse-width control signal to the signal generation circuit 40. Therefore, the pulse generation circuit 40 outputs a pulse of the transmission signal to the laser-diode drive circuit 12. The time point of the leading edge of the pulse is determined by the light-emission start requirement signal, while the width of the pulse is determined by the pulse-width control signal.

The laser-diode drive circuit 12 activates the laser diode 11 in response to the pulse of the transmission signal so that the laser diode 11 emits a corresponding pulse of the laser light. The time point of the leading edge of the pulse of the laser light is determined by the light-emission start requirement signal, while the width of the pulse of the laser light is determined by the pulse-width control signal. In the case where the step 130 determines the detection of an object (an obstacle), since the power control signal remains in the state corresponding to lower than the normal power, the power of the pulse of the laser light is lower than the normal power. On the other hand, in the case where the step 130 determines that an object (an obstacle) is not detected, since the power control signal is in the state corresponding to the normal power (see the step 140), the power of the pulse of the laser light is equal to the normal power. The pulse of the laser light is made into a pulse of the forward laser beam. In the case where the power of the pulse of the forward laser beam is relatively low, the measurable distance to an object is shorter than normal one. On the other hand, in the case where the power of the pulse of the forward laser